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Original Article

Study of the relationship between smoking habits and perceived work stress

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ABSTRACT

Introduction. Smoking and occupational stress are significant health issues. In Spain, tobacco causes 13% of annual deaths. Occupational stress, linked to psychosocial risks, is a recognized concern. The main objective is to analyze and understand the relationship between smoking habits and perceived occupational stress in workers at Ceuta Hospital.
Methods. A descriptive cross-sectional study using SPSS-10 data was conducted on a sample of 276 workers stratified across 17 professional categories. Data were collected through three questionnaires: a general one with sociodemographic variables, the Fagerström questionnaire, and the Perceived Stress Scale (PSS-10).
Results. The sample is mostly female (70%) with an average age of 47. 60% do not experience anxiety, stress, or depression, while 40% do. The PSS-10 scale yielded a mean of 16.24. Staff with fixed shifts showed higher stress (16.38). Those on 17-hour shifts scored the highest (21 points). Separated individuals experience more stress by civil status (average 19.80). Among professional categories, social workers lead (average 20.00). In smoking, 23.9% smoke, with laundry workers being more common (50%). The relationship between stress and dependence in smokers is not significant (p=0.121). 74.2% smoke during working hours.
Conclusions: There is no increased need to smoke due to occupational stress. Differences in smoking habits among professional categories underscore the importance of preventive strategies. Prioritizing activities to quit smoking will be emphasized.

Key words: occupational stress; nicotine dependence; health personnel

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Introduction

Smoking and work-related stress are two highly relevant problems in contemporary society, with a significant impact on people's health and well-being. Furthermore, they include not only physical aspects but also psychological and behavioral aspects (1),

In Spain, the Spanish Association Against Cancer (AECC) (2) reports that tobacco causes more than 52,000 deaths per year, representing 13% of total annual deaths.

According to the 2020 European Health Survey in Spain, 16.4% of women and 23.3% of men smoke daily. The population that smokes daily is concentrated between the ages of 25 and 64. The daily smoking population decreases after age 65 (3).

However, Martín-Vispo et al. state in their study that a probable initiation of tobacco use is driven by an attempt to counteract the symptoms of anxiety or avoid its negative consequences (4).

It has been found that a higher percentage of people with nicotine dependence are those with mood disorders (29.2%), personality disorders (27.3%), and anxiety disorders (25.3%) (5).

The Diagnostic and Statistical Manual of Mental Disorders (DSM-V) classifies anxiety disorders as "excessive anxiety and worry (apprehensive anticipation), occurring for more days than has been absent for at least six months, in relation to various events or activities (such as work or school)" (6).

When work-related stress becomes chronic, a response known as burnout syndrome manifests (7). Some media report that more than 43% of Spaniards report being emotionally exhausted in the workplace (8). This figure has also been exacerbated by the pandemic since 2020. According to the 2022 labor market guide, 30% of professionals have admitted that, since the pandemic, their feeling of work-related stress has increased (9).

Spain is among the countries with an average population suffering from this problem, along with the United States (38%), Norway, and Canada (both 40%), with Romania being the most affected country (68%) and Japan the least (20%) (10). Within the healthcare sector, scientific evidence shows that high levels of healthcare personnel are affected by this stress (between 30% and 60%) (11). "After the Covid-19 pandemic, burnout among healthcare personnel has quadrupled the rates of personal exhaustion, reaching

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levels of up to 50%" (12). There are some studies conducted in our country in the healthcare setting regarding burnout. However, it is difficult to determine the extent to which the prevalence of this syndrome increases across different professional categories. This is due, on the one hand, to the fact that it is a relatively new term (13), and on the other, to the influence of various variables such as shift work, the level of the institution where they work, and the specialty they specialize in, among others. One of these studies highlights that, specifically, Spanish nursing staff have a burnout rate of around 43% (14).

A study conducted in Finland showed that workers with work-related stress or who report having more stressful jobs are more likely to be smokers and consume more tobacco. (15).

The main objective of this research study is to analyze and understand the relationship between smoking habits and perceived work-related stress among workers at Ceuta Hospital.

Finally, through a review of previous studies and the collection of relevant data, the secondary objectives are to inform and promote effective interventions to improve the health and well-being of workers, thereby reducing the risks associated with tobacco use and work-related stress. Furthermore, the objective is to describe the current status of smoking habits and perceived work-related stress at the hospital.

Methods

Study design. Population. Sample

A cross-sectional study was conducted in the Ceuta University Hospital in 2023-2024.

The study population consisted of 977 workers, and the corresponding sample size was calculated, resulting in 276 workers for a 95% CI, considering both smokers and nonsmokers. Furthermore, professional categories were stratified so that each category was represented in the sample in the same proportion as in the base population. The professional categories studied were: 68 nurses (24.7%), 50 nursing assistants (18.18%), 31 physicians (11.24%), 29 administrative assistants (10.5%), 27 orderlies (9.42%), 18 technicians (6.52%), 12 nursing residents (EIR) (4.35%), 10 medical residents (MIR) (3.62%), 9 kitchen workers (3.27%), 6 maintenance workers (2.2%), 4 supervisors (1.45%), 4 laundry

workers (1.45%), 3 managers (1.1%), 2 physical therapists (0.8%), 1 pharmacist (0.4%), 1 computer scientist (0.4%), and 1 social worker (0.4%).

Eligibility criteria

Workers who met the following requirements were included in the study:

- Belonging to one of the previously described categories studied.
- Having duly signed the informed consent form.

Conversely, workers who identified with at least one of the following characteristics were excluded from the study:

- Having worked in the hospital for less than 1 month at the time of data collection.

Variables and measurements.

The variables studied in the sociodemographic questionnaire are the following: age, sex, height, weight, marital status, shift work, on-call duties, years worked in that professional category, years worked in the current service, past and current smoking habits, subjective perception of stress, history of medical diagnosis of stress, and stress-related medication. Although there are both quantitative and qualitative variables, all of them were treated as quantitative for analysis using SPSS-10.

The outcomes variables were:

PSS-10 Scale: The selection of the Perceived Stress Scale (PSS-10) is justified for several reasons.

1. Empirical support.
2. Brevity and ease of administration.
3. Multiple dimensions.
4. Comparable data.

Fagerström Scale: The Fagerström Questionnaire for Nicotine Dependence was chosen for measurement in this research for several compelling reasons:

1. It is widely used in smoking research.
2. It is easy to administer and score.
3. It assesses multiple aspects of dependence.

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Data Collection

The information was collected using health questionnaires, which were administered during health examinations and randomly at various worksites between May and August 2023. Along with these, a document explaining the study and the informed consent form (Annex 2) were provided to the worker, in which the worker consented to the collection of data and its subsequent analysis for studies anonymously.

In the data collection booklet (Annex 3), a total of three questionnaires were administered. First, a general questionnaire was administered ad hoc, in which sociodemographic information was obtained from the participating worker; and second, the Fagerström questionnaire and the Perceived Work Stress Scale PSS-10.

Ethical considerations

The study was conducted in strict compliance with ethical and legal regulations, ensuring the confidentiality of participants' personal data and obtaining their informed consent before data collection. The researchers also agree to comply with the current General Data Protection Regulation (GDPR) and respect the rights of participants.

Statistical Analysis

A descriptive analysis was carried out for sociodemographic, occupational, and outcome variables. Quantitative variables were summarized using the mean and standar deviation. Qualitative variables were described using absolute and relative frequencies.

For bivariate analysis, parametric tests were applied. The Chi-square test was used to assess associations between categorical variables, the T- Test for comparisons between two groups, and the ANOVA test for comparisons across more than two groups.

A p-value of <0.05 was considered statistically significant. The statistical analysis was conducted using SPSS ver. 25.

Results

Of the 276 workers studied in this study, 70% (n=194) are women and the remaining 30% (n=81) are men, ranging in age from 23 to 70 years old. The average age is 47 years (Table 1). 60% (n=166) report not suffering from or having previously suffered from anxiety, stress, or depression, while 40% (n=110) confirm suffering from or having suffered from these conditions. 18.8% (n=52) have a medical diagnosis confirming one of these conditions; however, the remaining 21.2% (n=58) consider them to be self-diagnosed and without medical context.

Table 1. Characteristics of the study sample

VARIABLE	TOTAL N = 275	MEN N=81 (29.5%)	WOMEN N=194 (60.5%)	P
AGE	47.3 (11.7)	46.8 (11.6)	47.4 (11.8)	0.7
BMI	26 (5)	26.8 (3.9)	25.6 (5.3)	0.08
SMOKERS	66 (24.5%)	17 (21.3%)	49 (25.3%)	0.48
MARITAL STATUS				
SINGLE	131 (47.8%)	44 (33.6%)	87 (66.4%)	0.13
NOT SINGLE	143 (52.2%)	36 (25.2%)	194 (74.8%)	
WORKING LIFE				
YEARS WORKING	16.1 (11.7)	17.8 (11.8)	15.5 (11.6)	0.15
YEARS CURRENT JOB	7.5 (8.7)	9.5 (11.4)	6.6 (7.7)	0.015
TYPE OF EMPLOYMENT				
INDEFINITE	119 (43.3%)	43 (36.1%)	76 (63.9%)	0.09
INTERIM	59 (21.5%)	16 (27.1%)	43 (72.9%)	
TEMPORARY	97 (35.3%)	22 (22.7%)	75 (77.3%)	
TURNICITY				
NON SHIFT	141 (51.8%)	47 (33.3%)	94 (66.7%)	0.13
NON- NIGHTSHIFT	17 (6.3%)	2 (11.8%)	15 (88.2%)	
NIGHT SHIFT	114 (41.9%)	30 (26.3%)	84 (73.7%)	

BMI: Body Mass Index

The mean score obtained on the PSS-10 scale for all workers is 16.24, with a minimum score of 5, a maximum score of 29, and a standard deviation of 4.714. Table 2 shows the PSS-10 total based on the shift work of the workers, whether or not they work on-call duty, and the type of shift performed, marital status, and professional category.

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Regarding shift work, fixed-shift workers score highest on the PSS-10 scale, with an average score of 16.38. This is followed by rotating shift workers with nights, with an average of 16.25, and finally rotating shift workers, in this case, without nights, with an average score of 15.24.

Table 2. Perceived Stress (PSS-10) according to profession and other variables

VARIABLE	N	PSS Mean (SD)	P
MEN	81	15.6 (4.7)	0.18
WOMEN	194	16.5 (4.7)	
PROFESSION			
NURSE	72	16.4 (5)	0.093
NURSING RESIDENT	12	13.6 (3.8)	
PHYSICIAN	41	15.4 (4.1)	
HOSPITAL PORTER	26	16 (4.3)	
ADMINISTRATIVE	29	15.5 (3.7)	
NURSING ASSISTANT	79	17.4 (5.3)	
OTHERS	16	15.9 (3.9)	
TURNICITY			
NON SHIFT	142	16.4 (4.5)	0.64
NON- NIGHTSHIFT	17	15.2 (3.8)	
NIGHT SHIFT	114	16.3 (5.1)	
WORK-SHIFT			
NOONE	211	16.5 (4.8)	0.14
12 hours	20	14.5 (3.7)	
>12 hours	45	15.8 (4.4)	
MARITAL STATUS			
SINGLE	131	15.8 (4.6)	0.12
NOT SINGLE	144	16.7 (4.8)	

SD: Stardard Deviation

Regarding shift work, workers who work 17-hour shifts score highest on the PSS10 scale, with an average of 21 points. These are followed by workers who work 24-hour shifts, both types of shifts (17 and 24 hours), those who do not work shifts, and finally, those who work 12-hour shifts.

Regarding marital status, the average score on the PSS-10 is as follows: separated individuals have an average of 19.80, married individuals 16.66, divorced individuals 16.04, single individuals 15.72, and widowed individuals 13.33. Therefore, the category of workers with a marital status of separated has more work-related stress than the other categories, with widowed and single individuals reporting the least work-related stress. In descending order of the total PSS-10 scores studied, the following sequence is shown: separated, married, divorced, single, and widowed. Finally, regarding professional categories, among healthcare personnel, the highest PSS-10 scores were found in: social workers (with an average of 20.00), nursing assistants (average of 18.50), pharmacy staff (average of 18.00), nurses and orderlies (16.53 and 15.96, respectively). Regarding non-healthcare personnel, the most notable are: IT staff (average 21), laundry staff (16.75%), technicians (15.61 on average), and administrative assistants (15.45).

Regarding smoking habits, 66% of workers (23.9%) report currently smoking, of which 25% are women and 21% are men. Within the categories studied, proportionally, laundry staff smoke the most (50%), followed by nursing assistants (34%), managers (33.3%), and medical residents (30%). Conversely, the groups that smoke the least are: kitchen staff (11.1%), nursing residents and maintenance staff (16.7%), and administrative assistants (17.2%). The average score obtained on the PSS-10 scale for smokers is 17.29, with a minimum score of 8, a maximum score of 29, and a standard deviation of 15.104, and the average for non-smokers is 15.90, with a minimum of 5, a maximum of 28, and a standard deviation of 4.548.

The average score on the Fagerström test is 2.24 (low nicotine dependence), with a minimum score of 0, a maximum of 8, and a standard deviation of 2.069.

To study the relationship between perceived stress (PSS-10) and smoking, specifically nicotine dependence (Fagerström test), a chi-square test was conducted only among smokers, i.e., 66 workers; a P value of 0.121 was obtained.

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Within this group of smokers, 74.2% reported smoking during working hours. Of the 17 categories studied, only 50% of those who admitted to smoking reported smoking in two of them: resident medical examiners and administrative staff. They smoke in the workplace. However, in the remaining 15 categories, more than 50% of those who smoke do so at work. The mean score on the PSS-10 scale for smokers who smoke during work hours is 17.61, with a minimum score of 8, a maximum score of 29, and a standard deviation of 5.560.
The mean score on the PSS-10 scale for smokers who do not smoke during work hours is 16.35, with a minimum score of 12, a maximum score of 26, and a standard deviation of 3.445.

Finally, this study also attempted to explore smoking cessation. Of the total workers, 45% admitted to having smoked before. Of these, only 4% needed medication to quit, 72% did not require pharmacological help, and the remainder continue to smoke today.

Discussion

This research analyzed the results of a study that assessed various variables related to work-related stress and smoking in a sample of 276 workers. It revealed that 23.9% of the workers smoked.

Unlike the results obtained in this study, which found no significant correlation between perceived work-related stress and smoking habits among workers at the Ceuta University Hospital (P>0.05), the articles by Ota et al. (16), Fernandes et al. (17), and Petrelli et al. (18) do show a significant association between workrelated stress and smoking habits.
However, a difference was found between the level of perceived work-related stress among workers who smoke compared to those who do not, with the level being higher among those who smoke. "Stress and sensitivity to anxiety predispose to increased tobacco use" (19-22).

The relationship between stress and smoking can vary in different work and population contexts, influenced by several variables.

One of the main variables that can be used for comparison in a healthcare setting is professional category. In a study conducted in Japan (22), healthcare personnel were found to smoke less than other workers in other professions. In the present study, the workers

who smoke the most are those who work in laundry, and therefore coincide with the aforementioned study. However, it is true that they are followed by nursing assistants, who, on the contrary, are considered healthcare personnel.

Furthermore, Ota et al. (16) emphasize the relationship between job demands and nicotine dependence. In this study, there is a link in the nursing assistant category, as they are the category with the second highest level of perceived stress and the second category with the highest number of smokers. However, there is no such clear association in the other categories. Another variable to consider in a study where the population is hospital staff is the difference between work shifts. According to Ota et al. (16), "those who have an irregular daily routine are less likely to engage in distracting activities and therefore reduce their stress through them." Although in this study, staff with fixed shifts reported the highest level of perceived stress, when comparing those who work rotating shifts without nights with those who do work nights, the latter show a higher level of perceived work stress. Merces MCD et al. (20) reported in their study a higher level of burnout in nursing staff who work shifts that include night hours.

Regarding on-call work performed by staff, Fernandes et al. (17) reported that those workers who work a shift of more than 12 hours have a significant association with the emotional exhaustion found in burnout syndrome. This study considered the possibility of shifts of 17 hours, 24 hours, 12 hours, or a combination of shifts (17 and 24 hours). It was found that workers who work 12 hours are those who report the least perceived stress, thus supporting the previous assertion that the greater the number of on-call hours, the higher the perceived stress level.

Discussion of this study with others found in the literature shows the relationship between marital status and mood. According to a study conducted in Japan (22) comparing healthcare workers with the general population, widowed and separated healthcare workers are the most exposed to burnout syndrome. These data partially agree with the present study, which shows that separated workers perceive the highest level of stress; however, widowed workers perceive the lowest level. In the Brazilian study (11) of ICU nurses, married individuals were the most likely to experience burnout syndrome, second only to those who were separated, as mentioned above.

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Regarding the prevalence of tobacco use during working hours, our results align with the concerns expressed by the National Institute for Occupational Safety and Health (NIOSH, 2023). (3) Nearly two-thirds of workers who smoke do so during working hours. This observation underscores the need to implement workplace policies that promote smoke-free environments as a key measure to reduce exposure and encourage healthier behaviors.

Finally, the analysis of smoking cessation revealed that, although a considerable percentage of workers had quit smoking, only a small percentage sought pharmacological help. These results highlight the need to promote smoking cessation programs and increase awareness of the resources available to those who wish to quit smoking. This trend is consistent with the recommendations of several previous studies, such as that of Martínez-Vispo C et al. (4).

The implementation of effective smoking cessation interventions can have a significant impact on the long-term health of workers.

Conclusions

Given that the results indicate no increase in the need to smoke related to perceived work-related stress, it is important to prioritize activities aimed at smoking cessation and continue with those aimed at managing mental health. The observation of significant differences in smoking patterns between various professional categories and the remaining variables underscores the need for further research to address the particular characteristics of each group when developing preventive strategies.

The limitations of the study, such as its cross-sectional design, suggest the need for longitudinal research to better understand causal relationships. Furthermore, the study was conducted in a single hospital with a smaller sample size compared to hospitals with a larger number of employees.

Finally, since this was a self-administered questionnaire and no objective testing could be performed to support it, the responses refer to the perception of the study subjects and are subjective in nature.

Conflict of interest

The authors declare that there is no conflict of interest.

Founding

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